

# VASCULAR FLORA OF WASHITA BATTLEFIELD NATIONAL HISTORIC SITE, ROGER MILLS COUNTY, OKLAHOMA

Bruce W. Hoagland

*Oklahoma Biological Survey  
and Department of Geography  
University of Oklahoma  
Norman, Oklahoma 73019, U.S.A.  
bhoagland@ou.edu*

Amy Buthod

*Oklahoma Biological Survey  
University of Oklahoma  
Norman, Oklahoma 73019, U.S.A.*

Wayne Elisens

*Oklahoma Biological Survey  
and Department of Botany and Microbiology  
University of Oklahoma  
Norman, Oklahoma 73019, U.S.A.*

## ABSTRACT

This article reports the results of a vascular plant inventory of the Washita Battlefield National Historic Site in western Oklahoma. Two hundred and seventy-two species of vascular plants were collected from 201 genera and 62 families. The most speciose families were the Poaceae (53), Asteraceae (48), Fabaceae (22) and Euphorbiaceae (22). One hundred and seventy-five species were perennials, ninety-five annuals, and 2 biennials. Twenty-eight woody plant species were present. Twenty-one species exotic to North America were collected representing 7.7% of the flora. Five species tracked by the Oklahoma Natural Heritage Inventory were found. This study reports 205 species previously not documented in Roger Mills County.

## ABSTRACT

Este artículo presenta los resultados de un inventario de flora vascular del Washita Battlefield National Historic Site en el Oeste de Oklahoma. Se colectaron doscientas setenta y dos especies de plantas vasculares pertenecientes a 201 géneros y 62 familias. Las familias con más especies fueron Poaceae (53), Asteraceae (48), Fabaceae (22) y Euphorbiaceae (22). Ciento setenta y cinco especies eran perennes, noventa y cinco anuales, y 2 bianuales. Estaban presentes veintiocho especies leñosas. Se colectaron veintiuna especies exóticas para Norte América que representan el 7.7% de la flora. Se encontraron cinco especies seguidas por el Oklahoma Natural Heritage Inventory. Este estudio cita 205 especies no documentadas previamente en el condado de Roger Mills.

## INTRODUCTION

The objectives of this study were twofold; to fill a gap in floristic data for western Oklahoma and provide resource managers at the Washita Battlefield National Historic Site (WBNHS) a comprehensive species list. Prior to 2002, when collecting began for this study, 446 specific and intraspecific taxa were reported from Roger Mills County (Hoagland 2004). *Erigeron bellidiastrum* Nutt., collected by J. Engelman on 3 July 1919, was the first botanical specimen gathered in Roger Mills County. There are no subsequent collection records until 1929.

Peak collecting years in Roger Mills County were 1939 (261 specimens), with the return of J. Engleman, and 1976 by Susan Barber and Rahmona Thompson (124 specimens) on behalf of the Robert Bebb Herbarium at the University of Oklahoma (Hoagland 2004). During the course of this research, Freeman et al. (2003) published a floristic list from the Thurman Ranch in Roger Mills County, located south of WBNHS, which documented 470 species from 85 families.

### Study Area

The WBNHS was established on 12 November 1996 and encompasses 136 hectares in Roger Mills County (Fig. 1). Latitudinal extent ranges from 35.63°N to 35.62°N and longitudinal extent from 99.70°W to 99.71°W. The WBNHS is located within the subtropical humid (Cf) climate zone (Trewartha 1968). Summers are warm (mean July temperature = 27.7°C) and humid, whereas winters are relatively short and mild (mean January temperature = 1.9°C). Mean annual precipitation is 105.6 cm, with periodic severe droughts (Oklahoma Climatological Survey 2004). Physiographically, the study area is located in the Osage Plains section of the Central Lowlands province (Hunt 1974) and within the High Plains province of Oklahoma (Curtis & Ham 1979). Elevation in the study area ranges from 588 m along the Washita River to 610 m. The surface geology is primarily Permian red sandstone in the uplands to the south of the Washita River, and Quaternary silt, sand and clay adjacent to and north of the river (Branson & Johnson 1979). The primary soil association at WBNHS is the Yahola-Port, which is composed of alluvial soils on bottomlands and terraces. The Woodward-Quinlan association occurs on uplands and is level to very steep loamy soils underlain by red sandstone (Burgess et al. 1959). The predominant potential vegetation types are mixedgrass prairie with a smaller component of bottomland forests and stabilized dunes (Duck & Fletcher 1943). Much of the Washita River bottomlands were cleared for agriculture and pasturage.

### METHODS

Eight collection sites were established at WBNHS for intensive floristic sampling. Sites were selected following a review of US Geological Survey 1:24,000 topographic maps and field reconnaissance. The predominant vegetation association at these sites was classified according to Hoagland (2000). Collection effort was not limited to established sites. Collections were made on a monthly basis from March through October 2002. Vouchers for species exotic to North America were made from naturalized populations only, thus excluding cultivated and ornamental plants. Specimens were processed at the Robert Bebb Herbarium of the University of Oklahoma (OKL) following standard herbarium techniques. Manuals used for specimen identification included Correll and Johnston (1970), Gould (1975), Waterfall (1969) and Great Plains Flora Association (1986). Origin, whether native to introduced to North America, was deter-



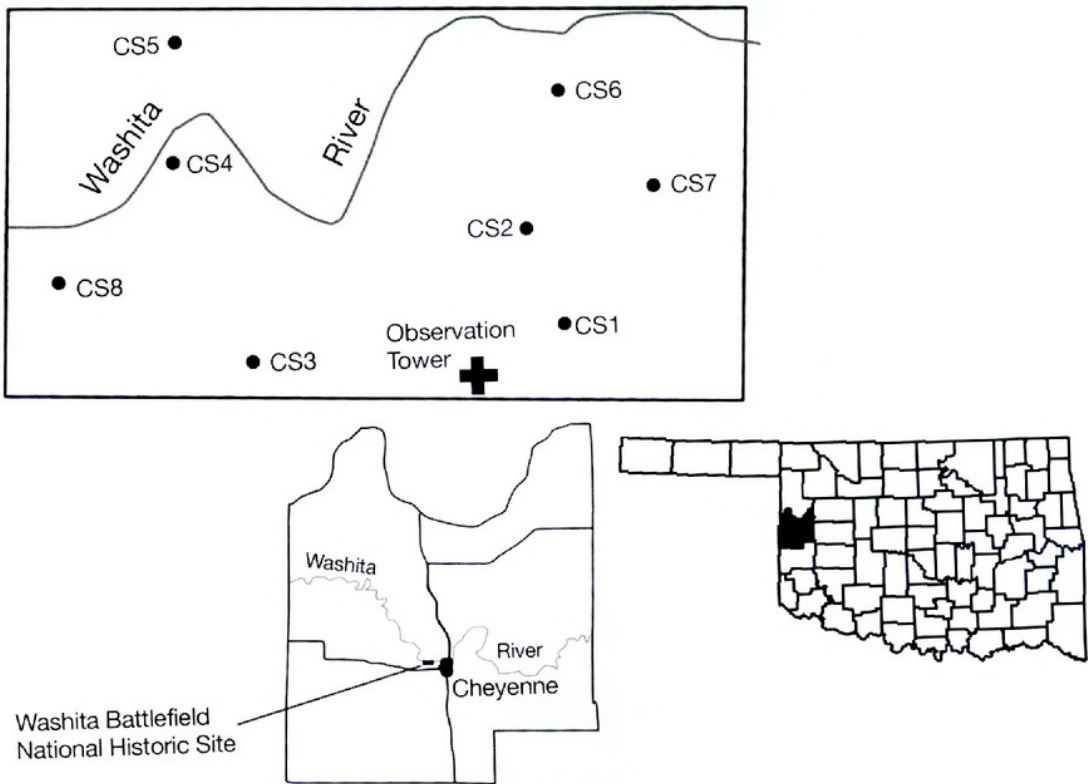


FIG. 1. Location of Washita Battlefield National Historic Site, Roger Mills County, Oklahoma.

mined using Taylor and Taylor (1991) and the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 2004). The nomenclature used is in concordance with USDA-NRCS (2004). Voucher specimens were deposited at OKL.

RESULTS AND DISCUSSION

A total of 272 vascular plants in 201 genera and 62 families were collected (Table 1). Among the angiosperms, 66 were monocots and 205 were dicots. One gymnosperm was found. The most species were collected from the families Poaceae (53), Asteraceae (48), Fabaceae (22), and Euphorbiaceae (14). The genera *Chamaesyce* (5), *Eragrostis* (4), *Dalea* (4), and *Solanum* (4) had the most species. Ninety-seven species were annual or biennials, and 178 perennial.

Twenty-one exotic species from 14 families were collected, representing 7.7% of the flora. The greatest number of exotic species were in the families Poaceae (11) and Asteraceae (4). This is higher than the 10% exotic flora reported from the Thurman Ranch (Freeman et al. 2002), but is comparable to recent floristic inventories from other areas in Oklahoma. For example, a flora of the Chickasaw National Recreation Area reported 12% exotic species (Hoagland & Johnson

TABLE 1. Summary of floristic collections at the Washita Battlefield National Historic Site, Roger Mills County, Oklahoma. Table format follows Palmer et al. (1995).

| Taxonomic Group | Species | Native spp. | Introduced spp. |
|-----------------|---------|-------------|-----------------|
| Equisetophyta   | 0       | 0           | 0               |
| Pteridophyta    | 0       | 0           | 0               |
| Coniferophyta   | 1       | 1           | 0               |
| Magnoliophyta   |         |             |                 |
| Magnoliopsida   | 205     | 184         | 21              |
| Liliopsida      | 66      | 56          | 10              |
| Total           | 271     | 240         | 31              |

2001), 9% at Oologah Wildlife Management Area (Hoagland & Wallick 2003), 15% at Keystone Wildlife Management Area, and 11% for an inventory of Tillman County (Hoagland et al., in press). However, the percentage was lower, 6.6%, at Red Slough and Grassy Slough in southeastern Oklahoma (Hoagland & Johnson, in press).

Five species tracked by the Oklahoma Natural Heritage Inventory were found: *Argythamnia humilis* (G5S2S3), *Gaura brachycarpa* (G4G5 S1S2), *Solanum triflorum* (G5S1S2), *Sporobolus giganteus* (G5S1S3), and *Zinnia grandiflora* (G5S?). Species are ranked according to level of imperilment at the state (S) and global (G) levels on a scale of 1–5; 1 representing a species that is imperiled and 5 one that is secure (Groves et al, 1995).

As a result of this study, 651 species are now known to occur in Roger Mills County. Of the 361 species reported in this study, 156 had been previously collected in the county (Hoagland 2004). This study documented 205 species not previously reported from Roger Mills County. When compared with the Dempsey Divide site (Freeman et al. 2002), there were 219 species found at both sites. However, 53 species were documented at WBNHS that were not reported at Dempsey Divide. Two hundred and fifty-one additional species were found on the Dempsey Divide that were not found at the WBNHS. The difference in total area of the two sites may account for this discrepancy; the Thurman Ranch is 3,755 hecatres in area and contains 19 vegetation types whereas WABA is only 136 hectares with four vegetation types. (Freeman et al. 2002).

The 8 collection sites occurred within four vegetation associations. A brief description of each follows:

***Sapindus saponaria* woodland association**

This association was limited to large sand dunes located on the northside of the Washita River. Although *S. saponaria* was abundant, dominance was locally variable. *Celtis laevigata* var. *reticulata* was a common woody species in this vegetation association, as was *Ulmus pumila*, a species introduced to western Oklahoma for shelterbelt plantings. Other common woody species included *Forestiera*



*pubescens*, *Gymnocladus dioicus*, *Prunus angustifolia*, *Ribes aureum*, and *Sideroxylon lanuginosum*. Associated herbaceous species included *Andropogon hallii*, *Argemone polyanthemus*, *Asclepias arenaria*, *Cyclanthera dissecta*, *Dimorphocarpa candicans*, *Froelichia gracilis*, and *Funastrum cynanchoides*.

***Schizachyrium scoparium*—*Bouteloua hirsuta* herbaceous association**

Occurred on Permian red sandstone in the uplands overlain by the Woodward-Quinlan soil association. Associated species included *Aristida oligantha*, *Ambrosia psilostachya*, *Bouteloua curtipendula*, *Eriogonum annuum*, *Penstemon albidus*, *Sphaeralcea coccinea*, *Thelesperma megapotamicum*, and *Yucca glauca*.

**Disturbed areas and old-field vegetation**

This includes much of the Washita River floodplain, which had been under cultivation for many years. It also includes roadsides and areas visited by WBNHS visitors and other areas exhibiting signs of physical disruption. Common plants in disturbed areas and old fields included *Ambrosia trifida*, *Bothriochloa ischaemum*, *Chenopodium simplex*, *Cynodon dactylon*, *Digitaria ciliaris*, *Melilotus officinalis*, and *Sorghum halepense*.

APPENDIX 1

Annotated species list for the Washita Battlefield National Historic Site. The first entry indicates life history (A=annual, P=perennial), species not native to North America (designated with an asterisk), habitat (DAOF=disturbed area/old-field; MGP=mixed grass prairie; RA=riparian area; SW=sandy woodland), and collection number. Voucher specimens were deposited at the Robert Bebb Herbarium at the University of Oklahoma (OKL).

**PINOPHYTA**

Cupressaceae

*Juniperus virginiana* L.—P; SW; WAS193

**MAGNOLIOPHYTA**

**MAGNOLIOPSIDA**

**Amaranthaceae**

*Amaranthus albus* L.—A; MGP; WAS322

*Amaranthus palmeri* S. Wats.—A; DAOF; WAS093

*Froelichia gracilis* (Hook.) Moq.—A; SW; WAS103

**Anacardiaceae**

*Rhus aromatica* L.—P; MGP; WAS230

*Rhus glabra* L.—P; MGP; WAS044

*Toxicodendron radicans* (L.) Kuntze—P; RA; WAS183

**Apiaceae**

*Chaerophyllum tainturieri* Hook.—A; MGP; WAS222

*Cymopterus macrorhizus* Buckl.—P; MGP; WAS171

**Apocynaceae**

*Apocynum cannabinum* L.—P; SW; WAS192

**Asclepiadaceae**

*Asclepias arenaria* Torr.—P; MGP; SW; WAS071

*Asclepias asperula* (Dcne.) Schlechter—P; MGP; WAS195

*Asclepias stenophylla* A. Gray—P; MGP; WAS050

*Asclepias syriaca* L.—P; MGP; WAS280

*Funastrum cynanchoides* (Dcne.) Schlechter—P; SW; WAS100

**Asteraceae**

*Ambrosia psilostachya* DC.—P; MGP; WAS148

*Ambrosia trifida* L.—A; MGP; WAS295

*Amphiachyris dracunculoides* (DC.) Nutt.—A; MGP; WAS283

*Aphanostephus skirrhobasis* (DC.) Trel.—A; MGP; WAS323

*Artemisia dracunculus* L.—P; MGP; WAS293

*Artemisia filifolia* Torr.—P; MGP; WAS116



- Artemisia ludoviciana* Nutt.–P; MGP; WAS289  
*Baccharis salicina* Torr. & A. Gray–P; RA; WAS118  
*Brickellia eupatorioides* (L.) Shinnery–P; MGP; WAS294  
*Chaetopappa ericoides* (Torr.) Nesom–P; MGP; WAS015  
*Cirsium undulatum* (Nutt.) Spreng.–P; MGP; WAS248  
*Cirsium vulgare* (Savi) Ten.–B; MGP; WAS247  
*Conyza canadensis* (L.) Cronq.–A; DAOF; WAS141  
*Eclipta prostrata* (L.) L.–A; RA; WAS133  
*Engelmannia peristenia* (Raf.) Goodman & Lawson–P; MGP; WAS034  
*Erigeron bellidiastrium* Nutt.–A; MGP, SW; WAS188  
*Eupatorium serotinum* Michx.–P; RA; WAS129  
*Euthamia gymnospermoides* Greene–P; DAOF; WAS314  
*Gaillardia pulchella* Foug.–A; MGP; WAS228  
*Gaillardia suavis* (A. Gray & Engelm.) Britt. & Rusby–P; MGP; WAS229  
*Grindelia papposa* Nesom & Suh–A; MGP; WAS153  
*Helianthus annuus* L.–A; DAOF; WAS080  
*Helianthus maximiliani* Schrad.–P; DAOF; WAS309  
*Helianthus petiolaris* Nutt.–A; DAOF; WAS084  
*Heterotheca subaxillaris* (Lam.) Britt. & Rusby–A; MGP; WAS144  
*Heterotheca villosa* (Pursh) Shinnery–P; MGP; WAS028  
*Hymenopappus flavescens* A. Gray–B; MGP; WAS258  
*Iva annua* L.–P; DAOF, RA; WAS317  
*Lactuca serriola* L.\*–A; MGP; WAS022  
*Liatris pycnostachya* Michx.–P; MGP; WAS282  
*Lygodesmia juncea* (Pursh) D. Don ex Hook.–P; MGP; WAS285  
*Machaeranthera pinnatifida* (Hook.) Shinnery–P; MGP; WAS277  
*Pluchea odorata* (L.) Cass. var. *odorata*–A; RA; WAS108  
*Ratibida columnifera* (Nutt.) Woot. & Standl.–P; MGP; WAS276  
*Solidago canadensis* L.–P; DAOF; WAS113  
*Solidago gigantea* Ait.–P; DAOF; WAS139  
*Solidago petiolaris* Ait.–P; MGP; WAS306  
*Symphotrichum ericoides* (L.) Nesom–P; DAOF; WAS311  
*Symphotrichum oblongifolium* (Nutt.) Nesom–P; MGP; WAS303  
*Symphotrichum subulatum* (Michx.) Nesom–A; RA; WAS132  
*Taraxacum officinale* G.H. Weber ex Wiggers\*–P; DAOF; WAS302  
*Tetrameuris scaposa* (DC.) Greene–P; MGP; WAS226  
*Thelesperma megapotamicum* (Spreng.) Kuntze–P; MGP; WAS051  
*Tragopogon dubius* Scop.\*–A; DAOF; WAS182  
*Verbesina encelioides* (Cav.) Benth. & Hook. f. ex A. Gray–A; DAOF; WAS087  
*Vernonia baldwinii* Torr.–P; DAOF; WAS105  
*Xanthium strumarium* L.–A; RA; WAS135  
*Zinnia grandiflora* Nutt.–P; MGP; WAS271
- Boraginaceae**
- Heliotropium convolvulaceum* (Nutt.) A. Gray–A; SW; WAS095  
*Lithospermum incisum* Lehm.–P; MGP; WAS172
- Brassicaceae**
- Camelina rumelica* Velen.–A; MGP; WAS231  
*Capsella bursa-pastoris* (L.) Medik.\*–A; DAOF; WAS176  
*Descurainia pinnata* (Walt.) Britt.–A; MGP; WAS177  
*Dimorphocarpa candicans* (Raf.) Rollins–A; SW; WAS120  
*Draba reptans* (Lam.) Fern.–A; MGP; WAS161  
*Lepidium oblongum* Small–A; MGP; WAS175  
*Lesquerella gordonii* (A. Gray) S. Wats.–A; MGP; WAS179
- Cactaceae**
- Escobaria vivipara* (Nutt.) Buxbaum–P; MGP; WAS315  
*Opuntia macrorhiza* Engelm.–P; MGP; WAS159
- Campanulaceae**
- Triodanis holzingeri* McVaugh–A; MGP; WAS266
- Caryophyllaceae**
- Arenaria serpyllifolia* L.\*–A; DAOF; WAS163  
*Paronychia jamesii* Torr. & A. Gray–P; MGP; WAS055  
*Stellaria media* (L.) Vill.\*–A; DAOF; WAS174
- Chenopodiaceae**
- Chenopodium album* L.\*–A; MGP; WAS287  
*Chenopodium simplex* (Torr.) Raf.–A; MGP; WAS150  
*Cycloloma atriplicifolium* (Spreng.) Coult.–A; MGP; WAS264  
*Kochia scoparia* (L.) Schrad.\*–A; MGP; WAS009

**Convolvulaceae**

- Convolvulus arvensis* L.\*-P; MGP; WAS196  
*Evolvulus nuttallianus* J. A. Schultes-P; MGP; WAS215  
*Ipomoea leptophylla* Torr.-P; MGP; WAS260

**Cucurbitaceae**

- Cucurbita foetidissima* Kunth-P; MGP; WAS018  
*Cyclanthera dissecta* (Torr. & A. Gray) Arn.-A; SW; WAS140

**Euphorbiaceae**

- Acalypha ostryifolia* Riddell-A; MGP; WAS031  
*Argythamnia humilis* (Engelm. & A. Gray) Muell.-Arg.-P; MGP; WAS068  
*Chamaesyce fendleri* (Torr. & A. Gray) Small-P; MGP; WAS060  
*Chamaesyce glyptosperma* (Engelm.) Small-A; MGP, SW; WAS090  
*Chamaesyce maculata* (L.) Small-A; DAOF; WAS122  
*Chamaesyce missurica* (Raf.) Shinnery-A; MGP, DAOF; WAS304  
*Chamaesyce stictospora* (Engelm.) Small-A; DAOF; WAS069  
*Croton glandulosus* L.-A; MGP; WAS037  
*Croton texensis* (Klotzsch) Muell.-Arg.-A; MGP; WAS011  
*Euphorbia dentata* Michx.-A; MGP; WAS012  
*Euphorbia hexagona* Nutt. ex Spreng.-A; MGP; WAS112  
*Euphorbia longicruris* Scheele-A; MGP; WAS160  
*Euphorbia marginata* Pursh-A; DAOF; WAS142  
*Tragia ramosa* Torr.-P; MGP; WAS058

**Fabaceae**

- Amorpha fruticosa* L.-P; RA; WAS086  
*Astragalus lotiflorus* Hook.-P; MGP; WAS180  
*Astragalus plattensis* Nutt.-P; MGP; WAS181  
*Baptisia australis* (L.) R. Br. ex Ait. f.-P; MGP; WAS191  
*Caesalpinia jamesii* (Torr. & A. Gray) Fisher-P; SW; WAS102  
*Cercis canadensis* L.-P; DAOF; WAS065  
*Chamaecrista fasciculata* (Michx.) Greene-A; MGP; WAS047  
*Dalea aurea* Nutt. ex Pursh-P; MGP; WAS274  
*Dalea candida* Michx. ex Willd.-P; MGP; WAS267  
*Dalea enneandra* Nutt.-P; MGP; WAS057  
*Dalea purpurea* Vent.-P; MGP; WAS250  
*Desmodium illinoense* A. Gray-P; MGP; WAS032  
*Gleditsia triacanthos* L.-P; SW; WAS300

- Gymnocladus dioica* (L.) K. Koch-P; SW; WAS016  
*Indigofera miniata* Ortega-P; SW; WAS091  
*Medicago minima* (L.) L.\*-A; DAOF; WAS224  
*Melilotus officinalis* (L.) Lam.\*-A; DAOF; WAS246  
*Mimosa borealis* A. Gray-P; MGP; WAS199  
*Mimosa nuttallii* (DC.) B.L. Turner-P; MGP; WAS201  
*Pediomelum linearifolium* (Torr. & A. Gray) J. Grimes-P; MGP; WAS048  
*Sophora nuttalliana* B.L. Turner-P; MGP; WAS243  
*Strophostyles leiosperma* (Torr. & A. Gray) Piper-A; MGP; WAS042

**Fumariaceae**

- Corydalis micrantha* (Engelm. ex A. Gray) A. Gray-A; MGP; WAS178

**Geraniaceae**

- Erodium cicutarium* (L.) L'Her. ex Ait.\*-A; DAOF; WAS169  
*Geranium pusillum* L.\*-A; MGP; WAS218

**Grossulariaceae**

- Ribes aureum* Pursh-P; SW; WAS167

**Juglandaceae**

- Juglans microcarpa* Berl.-P; SW; WAS101

**Krameriaceae**

- Krameria lanceolata* Torr.-P; MGP; WAS039

**Lamiaceae**

- Lamium amplexicaule* L.\*-A; DAOF; WAS168  
*Lycopus americanus* Muhl. ex W. Bart.-P; RA; WAS128  
*Monarda clinopodioides* A. Gray-A; MGP; WAS251  
*Monarda punctata* L.-A; MGP; WAS254  
*Salvia azurea* Michx. ex Lam.-P; MGP; WAS301  
*Scutellaria resinosa* Torr.-P; MGP; WAS040  
*Scutellaria wrightii* A. Gray-P; MGP; WAS214  
*Teurcium canadense* L.-P; RA; WAS075  
*Teurcium laciniatum* Torr.-P; MGP; WAS221

**Linaceae**

- Linum pratense* (J.B.S. Norton) Small-A; MGP; WAS212  
*Linum rigidum* Pursh-A; MGP; WAS204

**Loasaceae**

- Mentzelia nuda* (Pursh) Torr. & A. Gray-P; MGP; WAS155

**Lythraceae**

- Ammania coccinea* Rottb.-A; RA; WAS143



**Malvaceae**

*Callirhoe involucrata* (Torr. & A. Gray) A. Gray-P;  
MGP; WAS279

*Hibiscus trionum* L.\*-P; MGP; WAS269

*Sphaeralcea coccinea* (Nutt.) Rydb.-P; MGP;  
WAS219

**Menispermaceae**

*Cocculus carolinus* (L.) DC.-P; SW; WAS078

**Molluginaceae**

*Mollugo verticillata* L.-A; DAOF, SW; WAS024

**Moraceae**

*Morus alba* L.\*-P; DAOF; WAS061

**Nyctaginaceae**

*Mirabilis albida* (Walt.) Heimerl-P; MGP; WAS298

*Mirabilis linearis* (Pursh) Heimerl-P; MGP; WAS030

*Mirabilis nyctaginea* (Michx.) MacM.-P; MGP, SW;  
WAS189

**Oleaceae**

*Forestiera pubescens* Nutt.-P; SW; WAS036

**Onagraceae**

*Calylophus berlandieri* Spach-P; MGP; WAS207

*Calylophus hartwegii* (Benth.) Raven-P; MGP;  
WAS237

*Calylophus serrulatus* (Nutt.) Raven-P; MGP;  
WAS049

*Gaura brachycarpa* Small-A; MGP; WAS202

*Gaura parviflora* Dougl. ex Lehm.-A; MGP;  
WAS010

*Oenothera jamesii* Torr. & A. Gray-P; RA; WAS125

*Oenothera laciniata* Hill-P; MGP; WAS206

*Oenothera rhombipetala* Nutt. ex Torr. & A. Gray-P;  
MGP; WAS265

**Oxalidaceae**

*Oxalis stricta* L.-P; SW; WAS110

**Papaveraceae**

*Argemone polyanthemus* (Fedde) G.B. Ownbey-A;  
SW; WAS098

**Pedaliaceae**

*Proboscidea louisianica* (P. Mill.) Thellung-A; MGP;  
WAS041

**Plantaginaceae**

*Plantago patagonica* Jacq.-A; MGP; WAS197

*P. rhodosperma* Dcne.-A; MGP; WAS225

**Polygonaceae**

*Eriogonum annuum* Nutt.-A; DAOF, MGP;  
WAS088

*Eriogonum longifolium* Nutt.-P; MGP; WAS054

*Polygonum aviculare* L.\*-A; MGP; WAS014

*Polygonum lapathifolium* L.-A; RA; WAS136

*Rumex crispus* L.\*-P; MGP; WAS185

**Portulacaceae**

*Portulaca oleracea* L.-A; OF; WAS066

**Primulaceae**

*Androsace occidentalis* Pursh-A; MGP; WAS162

**Ranunculaceae**

*Delphinium carolinianum* Walt. ssp. *virescens*  
(Nutt.) Brooks-P; MGP; WAS240

**Rosaceae**

*Prunus angustifolia* Mars.-P; SW; WAS291

**Rubiaceae**

*Cephalanthus occidentalis* L.-P; RA; WAS106

*Galium pilosum* Ait.-P; DAOF; WAS089

*Hedyotis nigricans* (Lam.) Fosberg-P; MGP;  
WAS273

**Salicaceae**

*Populus deltoides* Bartr. ex Marsh.-P; RA; WAS117

*Salix exigua* Nutt.-P; RA; WAS111

*Salix nigra* Marsh.-P; RA; WAS085

**Sapindaceae**

*Sapindus saponaria* L.-P; SW; WAS070

**Sapotaceae**

*Sideroxylon lanuginosum* Michx.-P; SW; WAS046

**Scrophulariaceae**

*Castilleja purpurea* (Nutt.) G. Don var. *citrina*  
(Pennell) Shinnars-P; MGP; WAS232

*Penstemon albidus* Nutt.-P; MGP; WAS213

*Veronica arvensis* L.\*-A; DAOF; WAS165

**Solanaceae**

*Chamaesaracha conioidea* (Moric. ex Dunal)  
Britt.-P; MGP; WAS238

*Physalis cinerascens* (Dunal) A.S. Hitchc.-P; MGP;  
WAS205

*Physalis longifolia* Nutt.-P; MGP; WAS019

*Quincula lobata* (Torr.) Raf.-P; DAOF; WAS203

*Solanum dimidiatum* Raf.-P; DAOF; WAS194

*Solanum elaeagnifolium* Cav.-P; DAOF, MGP;  
WAS234

*Solanum rostratum* Dunal-A; DAOF, MGP;  
WAS025

*Solanum triflorum* Nutt.-A; MGP; WAS029



**Tamaricaceae**

*Tamarix ramosissima* Ledeb.\*-P; RA; WAS115

**Ulmaceae**

*Celtis laevigata* Willd. var. *reticulata* (Torr.) L. Benson-P; SW; WAS045

*Ulmus pumila* L.\*-P; SW; WAS268

*Ulmus rubra* Muhl.-P; SW; WAS154

**Urticaceae**

*Parietaria pensylvanica* Muhl. ex Willd.-A; DAOF, SW; WAS190

**Verbenaceae**

*Glandularia pumila* (Rydb.) Umber-A; DAOF, MGP; WAS198

*Phyla lanceolata* (Michx.) Greene-P; RA; WAS096

**Violaceae**

*Hybanthus verticillatus* (Ortega) Baill.-P; MGP; WAS242

**Vitaceae**

*Ampelopsis cordata* Michx.-P; RA; WAS121

*Cissus incisa* auct. non Des Moulins-P; SW; WAS072

*Vitis acerifolia* Raf.-P; RA; WAS109

**Zygophyllaceae**

*Kallstroemia parviflora* J.B.S. Norton-A; DAOF; WAS004

*Tribulus terrestris* L.\*-A; DAOF; WAS308

**LILIOPSIDA****Agavaceae**

*Yucca glauca* Nutt.-P; MGP; WAS200

**Commelinaceae**

*Commelina erecta* L.-P; MGP; WAS052

*Tradescantia occidentalis* (Britt.) Symth-P; MGP; WAS217

**Cyperaceae**

*Carex grvida* Bailey-P; MGP; WAS241

*Cyperus odoratus* L.-A; MGP; WAS145

*Cyperus schweinitzii* Torr.-P; MGP; WAS023

*Cyperus setigerus* Torr. & Hook.-P; RA; WAS126

*Fimbristylis vahlii* (Lam.) Link-A; RA; WAS137

*Schoenoplectus pungens* (Vahl) Pall.-P; RA; WAS077

**Iridaceae**

*Sisyrinchium angustifolium* P. Mill.-P; MGP; WAS236

**Juncaceae**

*Juncus torreyi* Coville-P; RA; WAS083

**Liliaceae**

*Allium canadense* L.-P; MGP; WAS227

*Allium drummondii* Regel-P; MGP; WAS173

**Poaceae**

*Andropogon hallii* Hack.-P; MGP, SW; WAS073

*Aristida oligantha* Michx.-A; MGP; WAS325

*Aristida purpurea* Nutt.-P; MGP; WAS053

*Bothriochloa ischaemum* (L.) Keng\*-P; MGP; WAS299

*Bothriochloa laguroides* (DC.) Herter-P; MGP; WAS257

*Bouteloua curtipendula* (Michx.) Torr.-P; MGP; WAS020

*Bouteloua gracilis* (Willd. ex Kunth) Lag. ex Griffiths-P; DAOF, MGP; WAS272

*Bouteloua hirsuta* Lag.-P; MGP; WAS005

*Bromus japonicus* Thunb. ex Murr.\*-A; DAOF, SW; WAS239

*Buchloe dactyloides* (Nutt.) Engelm.-P; DAOF, MGP; WAS223

*Cenchrus spinifex* Cav.-P; SW; WAS097

*Chloris verticillata* Nutt.-P; DAOF, MGP; WAS263

*Cynodon dactylon* (L.) Pers.\*-P; DAOF; WAS255

*Dichanthelium malacophyllum* (Nash) Gould-P; MGP; WAS261

*Dichanthelium oligosanthes* (J.A. Schultes) Gould-P; MGP; WAS253

*Digitaria ciliaris* (Retz.) Koel.-P; DAOF; WAS001

*Digitaria cognata* (J.A. Schultes) Pilger-P; MGP; WAS256

*Distichlis spicata* (L.) Greene-P; DAOF; WAS062

*Echinochloa crus-galli* (L.) Beauv.\*-A; RA; WAS127

*Elymus canadensis* L.-P; MGP; WAS297

*Elymus virginicus* L.-P; RA; WAS076

*Eragrostis barrelieri* Daveau\*-A; DAOF; WAS307

*Eragrostis cilianensis* (All.) Vign. ex Janchen\*-A; DAOF; WAS007

*Eragrostis curvula* (Schrud.) Nees\*-P; MGP; WAS281

*Eragrostis spectabilis* (Pursh) Steud.-P; SW; WAS099

*Erioneuron pilosum* (Buckl.) Nash-P; MGP; WAS318

*Hordeum pusillum* Nutt.-A; DAOF; WAS208

*Leptochloa fusca* (L.) Kunth ssp. *fascicularis* (Lam.) N. Snow-A; RA; WAS134

*Lolium perenne* L.\*-P; MGP; WAS252

- Muhlenbergia asperifolia* (Nees & Meyen ex Trin.) Parodi-P; SW; WAS158  
*Muhlenbergia racemosa* (Michx.) B.S.P.-P; MGP; WAS152  
*Muhlenbergia sobolifera* (Muhl. ex Willd.) Trin.-P; MGP; WAS151  
*Panicum capillare* L.-A; MGP; WAS026  
*Panicum obtusum* Kunth-P; MGP; RA; WAS124  
*Panicum virgatum* L.-P; MGP; WAS319  
*Pascopyrum smithii* (Rydb.) A. Love-P; MGP; WAS064  
*Paspalum setaceum* Michx.-P; DAOF; WAS081  
*Poa arachnifera* Torr.-P; RA; WAS244  
*Saccharum giganteum* (Walt.) Pers.-P; RA; WAS147  
*Schedonnardus paniculatus* (Nutt.) Trel.-P; DAOF; WAS063  
*Schizachyrium scoparium* (Michx.) Nash-P; MGP; WAS156  
*Setaria parviflora* (Poir.) Kerguelen-P; DAOF; WAS114  
*Setaria viridis* (L.) Beauv.\*-A; MGP; WAS021  
*Sorghastrum nutans* (L.) Nash-P; MGP; WAS130  
*Sorghum halepense* (L.) Pers.\*-P; DAOF; WAS270  
*Spartina pectinata* Bosc ex Link-P; RA; WAS074  
*Sporobolus cryptandrus* (Torr.) A. Gray-P; MGP; SW; WAS079  
*Sporobolus giganteus* Nash-P; MGP; WAS321  
*Sporobolus vaginiflorus* (Torr. ex A. Gray) Wood-A; SW; WAS138  
*Tridens flavus* (L.) A.S. Hitchc.-P; DAOF; WAS119  
*Triplasis purpurea* (Walt.) Chapman-A; MGP; WAS288  
*Triticum aestivum* L.\*-A; DAOF; WAS187  
*Vulpia octoflora* (Walt.) Rydb.-A; MGP; WAS211

#### ACKNOWLEDGMENTS

This project was funded by a grant from the National Park Service. We thank Adam K. Ryburn and anonymous review for their helpful comments on an earlier draft.

#### REFERENCES

- BRANSON C.C. and K.S. JOHNSON. 1979. Generalized geologic map of Oklahoma. In: K.S. Johnson, C.C. Branson, N.M. Curtis, W.E. Ham, W.E. Harrison, M.V. Marcher, and J.F. Roberts, eds. Geology and earth resources of Oklahoma. Oklahoma Geological Survey, Norman. P.4.  
 BURGESS, D.L., J.D. NICHOLS, and O.G. HENSON. 1959. Soil survey of Love County, Oklahoma. United States Department of Agriculture, Washington D.C.  
 CORRELL, D. S. and M.C. JOHNSTON. 1970. Manual of the vascular plants of Texas. Texas Research Foundation, Renner.  
 CURTIS N.M. and W.E. HAM. 1979. Geomorphic provinces of Oklahoma. In: K.S. Johnson, C.C. Branson, N.M. Curtis, W.E. Ham, W.E. Harrison, M.V. Marcher, and J.F. Roberts, eds. Geology and earth resources of Oklahoma. Oklahoma Geological Survey, Norman. P.45.  
 DUCK L.G. and J.B. FLETCHER. 1943. A game type map of Oklahoma. Oklahoma Department of Wildlife Conservation, Oklahoma City.  
 FREEMAN, C.C., C.A. MORSE, and J.P. THURMOND. 2003. The vascular flora of the Ogallala ecotone on the Dempsey Divide, Roger Mills County, Oklahoma. Sida 20:1217-1245.  
 Great Plains Flora Association. 1986. Flora of the Great Plains. University Press of Kansas, Lawrence.  
 GROVES C.R., M.L. KLEIN, and T.F. BREDEN. 1995. Natural heritage programs: public-private partnerships for biodiversity conservation. Wildlife Soc. Bull. 23:784-790.  
 GOULD, F.W. 1975. The grasses of Texas. Texas A&M University Press, College Station.



- HOAGLAND B.W. 2000. The vegetation of Oklahoma: a classification of landscape mapping and conservation planning. *Southwest Nat.* 45:385–420.
- HOAGLAND, B.W. 2004. Atlas of the flora of Oklahoma [online]. Available: [www.biosurvey.ou.edu](http://www.biosurvey.ou.edu). (Accessed on 14 January 2004).
- HOAGLAND B.W. and A. BUTHOD. 2003. Vascular flora of the Keystone Wildlife Management Area, Creek, Pawnee, and Osage counties, Oklahoma. *Oklahoma Native Pl. Record* 3: 23–37.
- HOAGLAND B.W. and F.L. JOHNSON. In press. The vascular flora of Red Slough and Grassy Slough Wildlife Management Areas, Gulf Coastal Plain, McCurtain County, Oklahoma. *Castanea* 69.
- HOAGLAND B.W. and F.L. JOHNSON. 2001. Vascular flora of the Chickasaw National Recreation Area, Murray County, Oklahoma. *Castanea* 66:383–400.
- HOAGLAND B.W. and K. WALLICK. 2003. Vascular flora of Oologah Wildlife Management Area, Nowata County, Oklahoma. *Proceedings of the Oklahoma Academy of Science* 83: 47–62.
- HOAGLAND B.W., P. CRAWFORD-CALLAHAN, P. CRAWFORD, and F.L. JOHNSON. 2004. Vascular flora of Hackberry Flat, Frederick Lake, and Suttle Creek, Tillman County, Oklahoma. *Sida* 21: 429–445.
- HUNT C.B. 1974. *Natural Regions of the United States and Canada*. W.H. Freeman, San Francisco.
- OKLAHOMA CLIMATOLOGICAL SURVEY. 2004. Oklahoma Climatological Data [online]. Available: [www.ocs.ou.edu/](http://www.ocs.ou.edu/). (Accessed on 1 March 2004).
- OKLAHOMA NATURAL HERITAGE INVENTORY. 2004. ONHI working list of rare Oklahoma plants [online]. Available: [www.biosurvey.ou.edu/publicat.html](http://www.biosurvey.ou.edu/publicat.html). (Accessed on 1 March 2004).
- PALMER M.W., G.L. WADE, and P. NEAL. 1995. Standards for the writing of floras. *Bioscience* 45:339–345.
- TAYLOR R.J. and C.S. TAYLOR. 1991. *An annotated list of the ferns, fern allies, gymnosperms, and flowering plants of Oklahoma*. Southeastern Oklahoma State University, Durant.
- TREWARtha G.T. 1968. *An introduction to Climate*. McGraw-Hill, New York.
- USDA-NRCS 2004. The PLANTS database [online]. Available: [plants.usda.gov/plants](http://plants.usda.gov/plants). National Plant Data Center, Baton Rouge, LA. (Accessed on 14 January 2004).
- WATERFALL, U.T. 1969. *Keys to the flora of Oklahoma*. 4th edition. Published by the author, New York.



Hoagland, Bruce W , Buthod, Amy, and Elisens, Wayne J. 2004. "VASCULAR FLORA OF WASHITA BATTLEFIELD NATIONAL HISTORIC SITE, ROGER MILLS COUNTY, OKLAHOMA." *SIDA, contributions to botany* 21, 1187–1197.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/34585>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/163671>

**Holding Institution**

Missouri Botanical Garden, Peter H. Raven Library

**Sponsored by**

Missouri Botanical Garden

**Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.